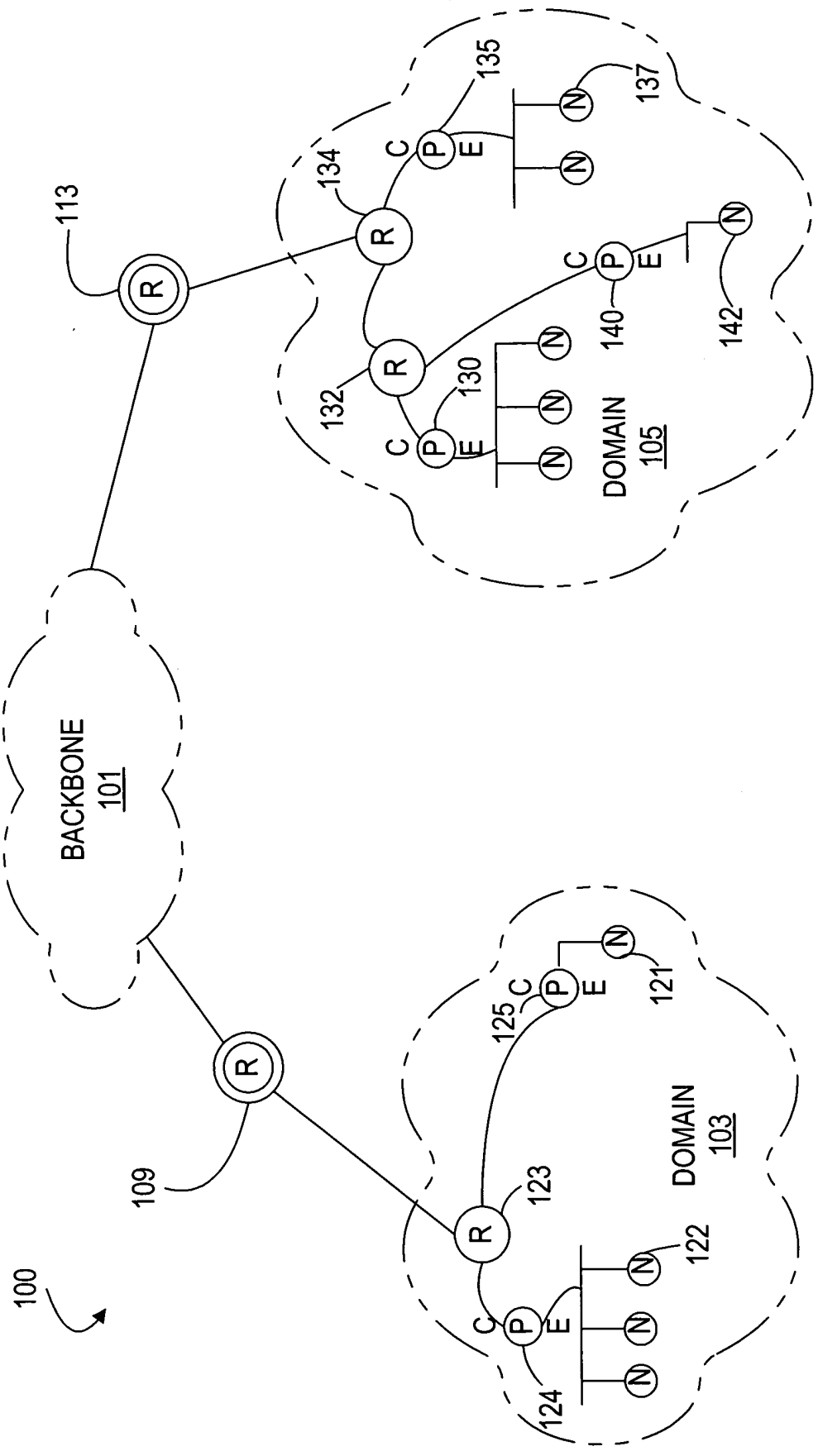

100
BACKBONE
101
109
113
R
DOMAIN
103
DOMAIN
105
123
125
121
122
124
132
134
135
137
140
142
130
C
P
E
N

FIG. 1

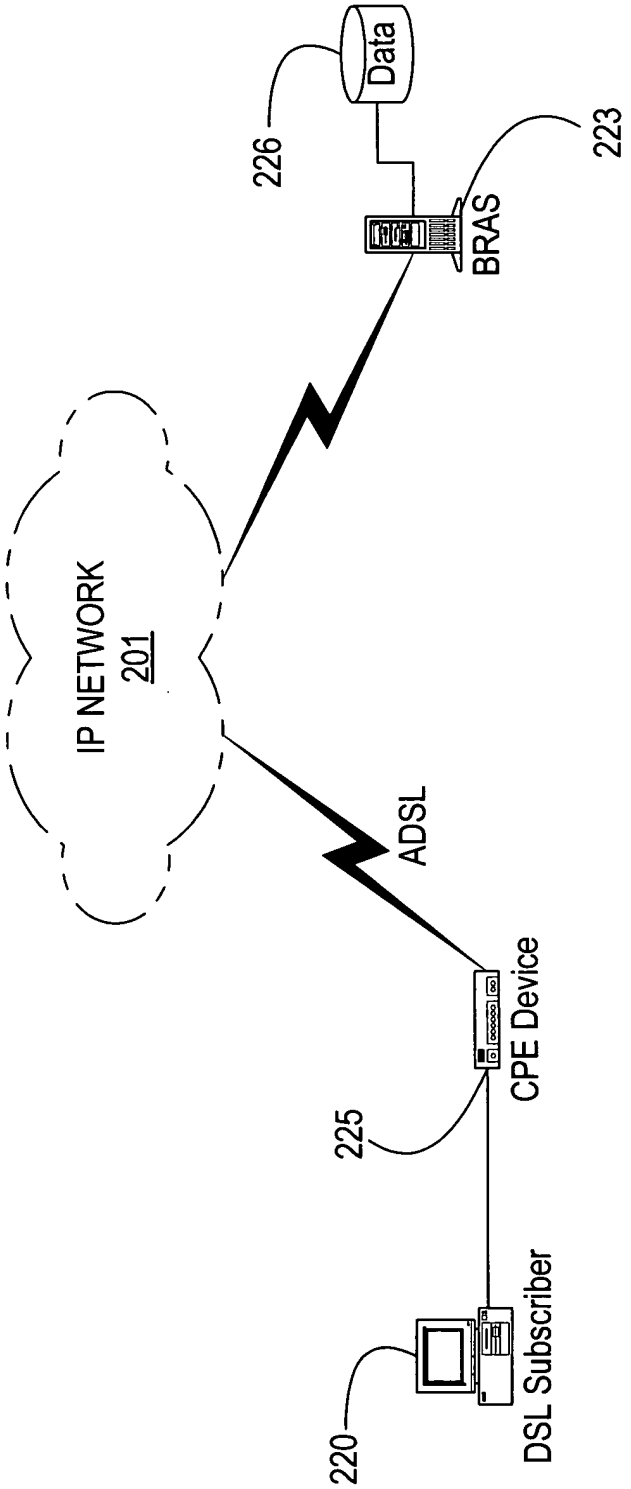

Data
226
223
BRAS
IP NETWORK
201
ADSL
CPE Device
225
DSL Subscriber
220

FIG. 2

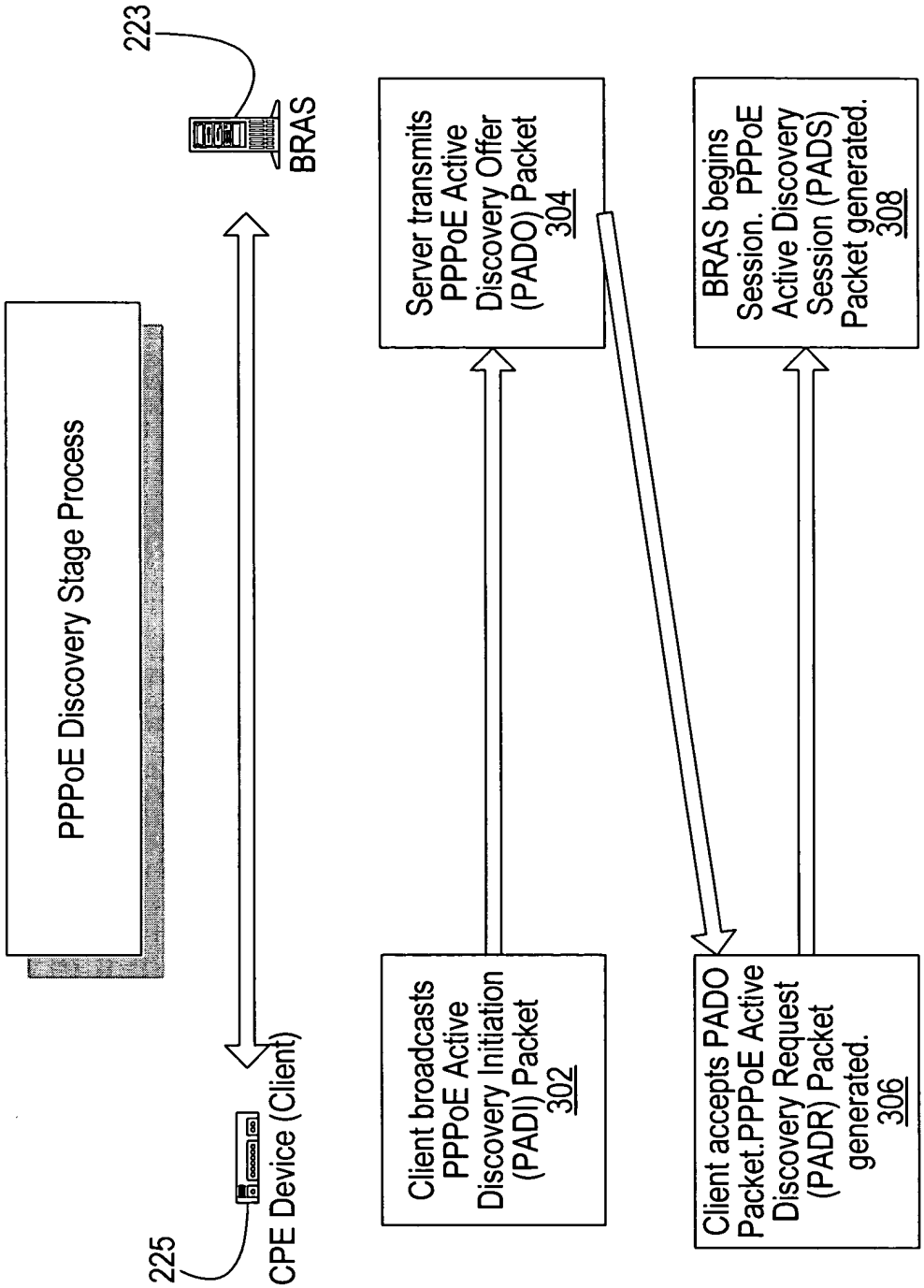

PPPoE Discovery Stage Process
223
BRAS
225
CPE Device (Client)
Client broadcasts PPPoE Active Discovery Initiation (PADI) Packet 302
Server transmits PPPoE Active Discovery Offer (PADO) Packet 304
Client accepts PADO Packet.PPPoE Active Discovery Request (PADR) Packet generated. 306
BRAS begins Session. PPPoE Active Discovery Session (PADS) Packet generated. 308

FIG. 3

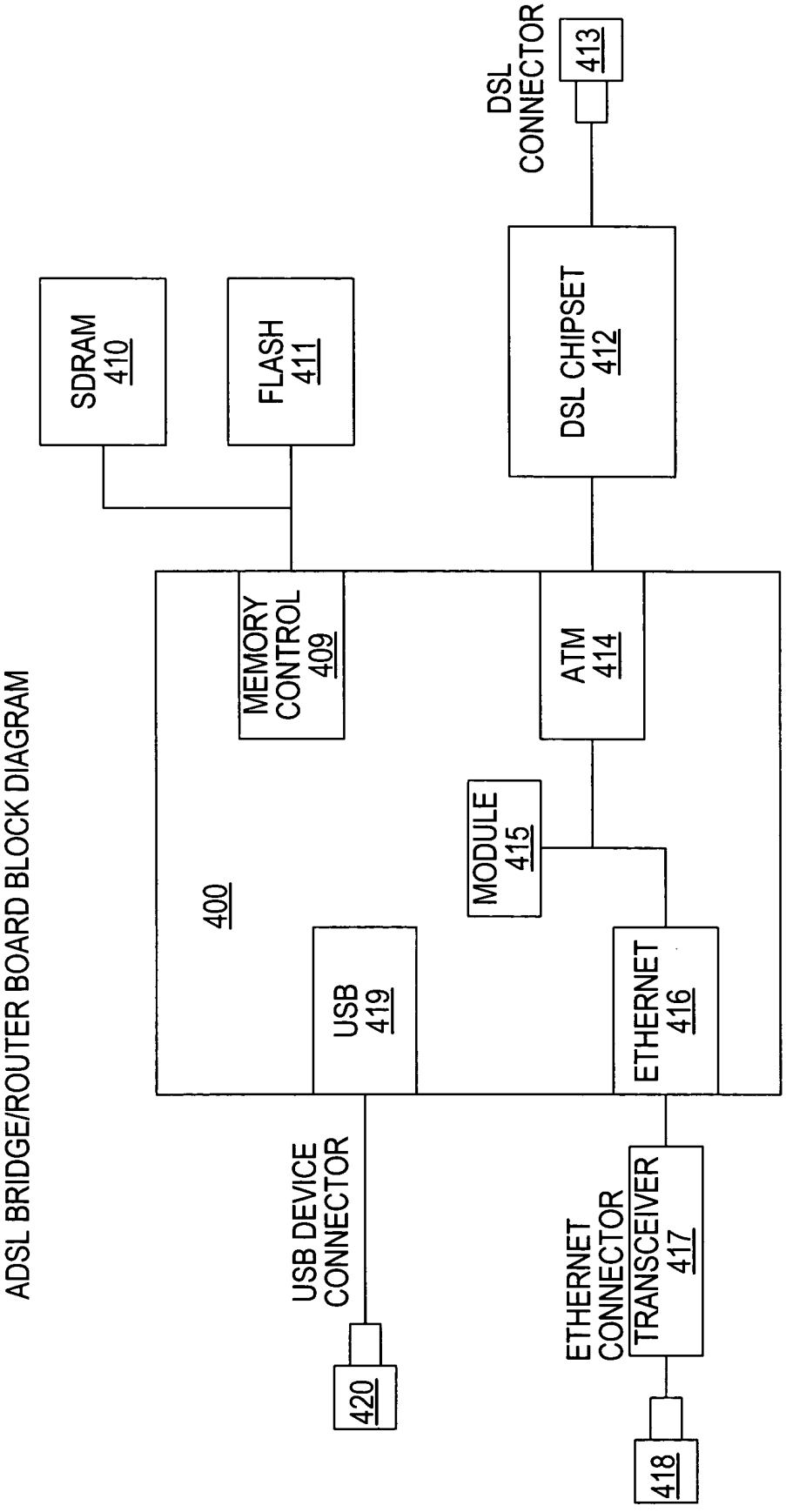

ADSL BRIDGE/ROUTER BOARD BLOCK DIAGRAM
400
SDRAM 410
FLASH 411
DSL CHIPSET 412
DSL CONNECTOR 413
MEMORY CONTROL 409
ATM 414
MODULE 415
USB 419
ETHERNET 416
USB DEVICE CONNECTOR
420
ETHERNET CONNECTOR
TRANSCEIVER 417
418

FIG. 4

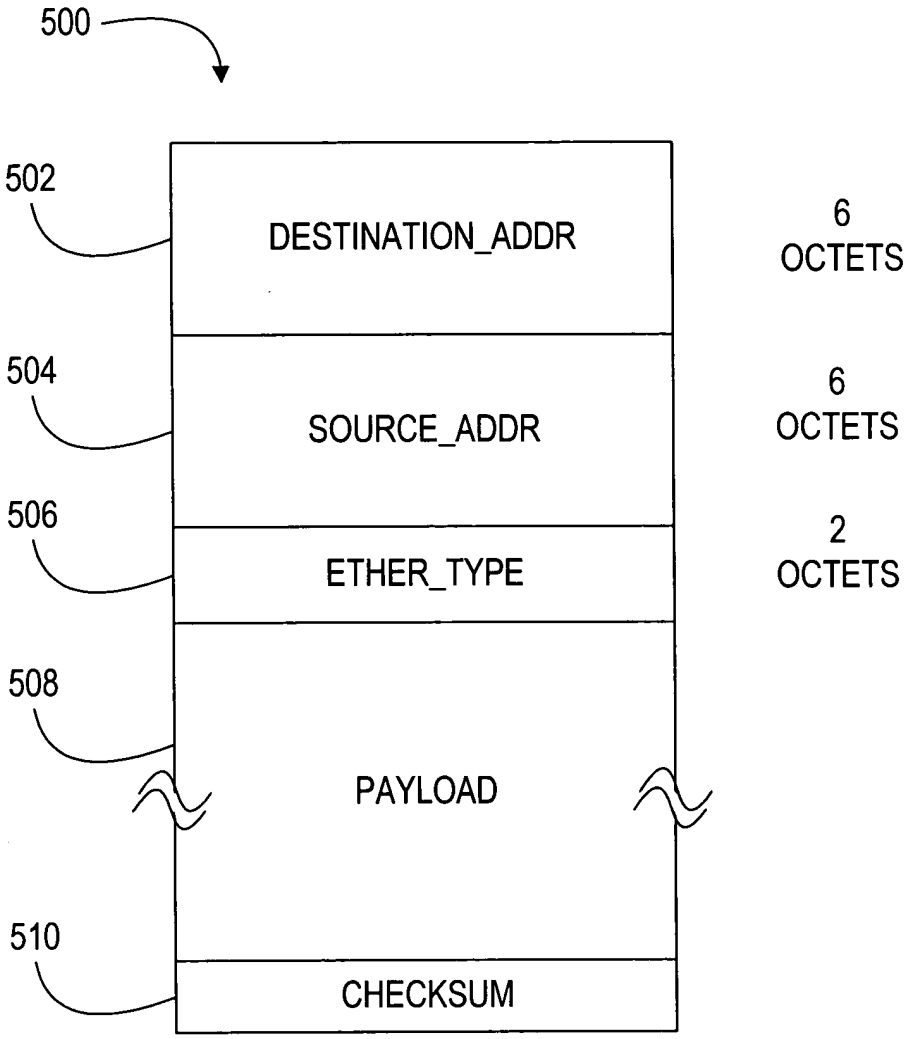

500
502
DESTINATION_ADDR
6
OCTETS
504
SOURCE_ADDR
6
OCTETS
506
ETHER_TYPE
2
OCTETS
508
PAYLOAD
510
CHECKSUM

FIG. 5

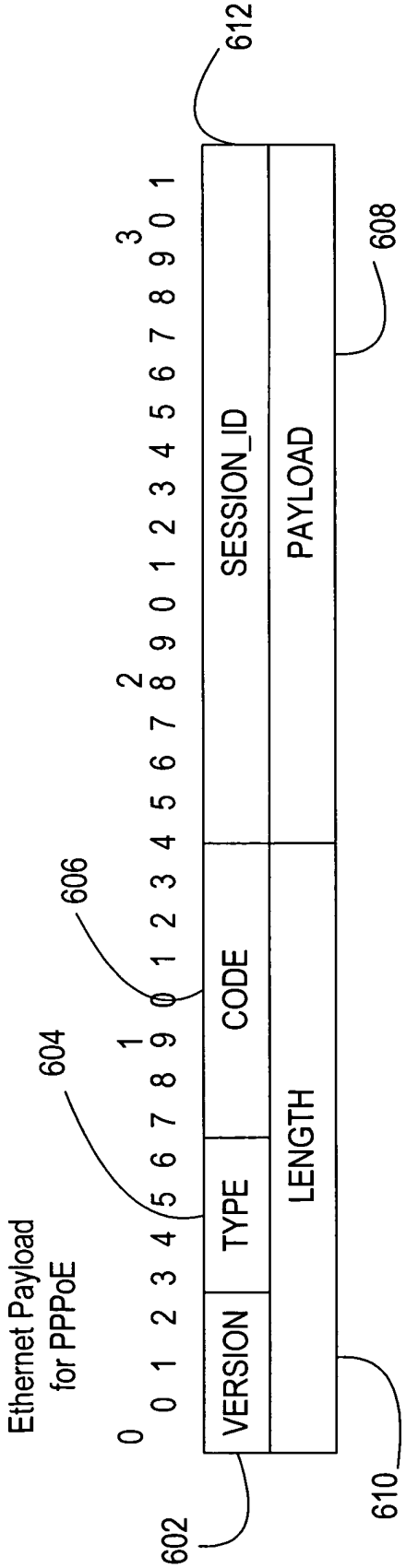

Ethernet Payload
for PPPoE
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
VERSION
TYPE
CODE
SESSION_ID
LENGTH
PAYLOAD
602
604
606
608
610
612

FIG. 6

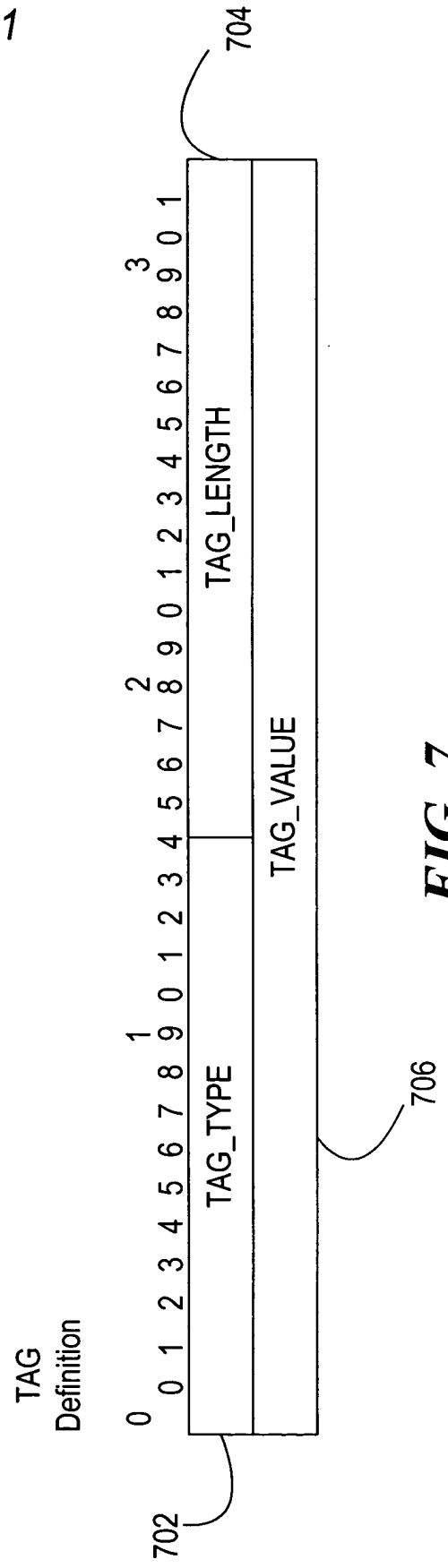

TAG
Definition
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
TAG_TYPE
TAG_LENGTH
TAG_VALUE
702
704
706

FIG. 7

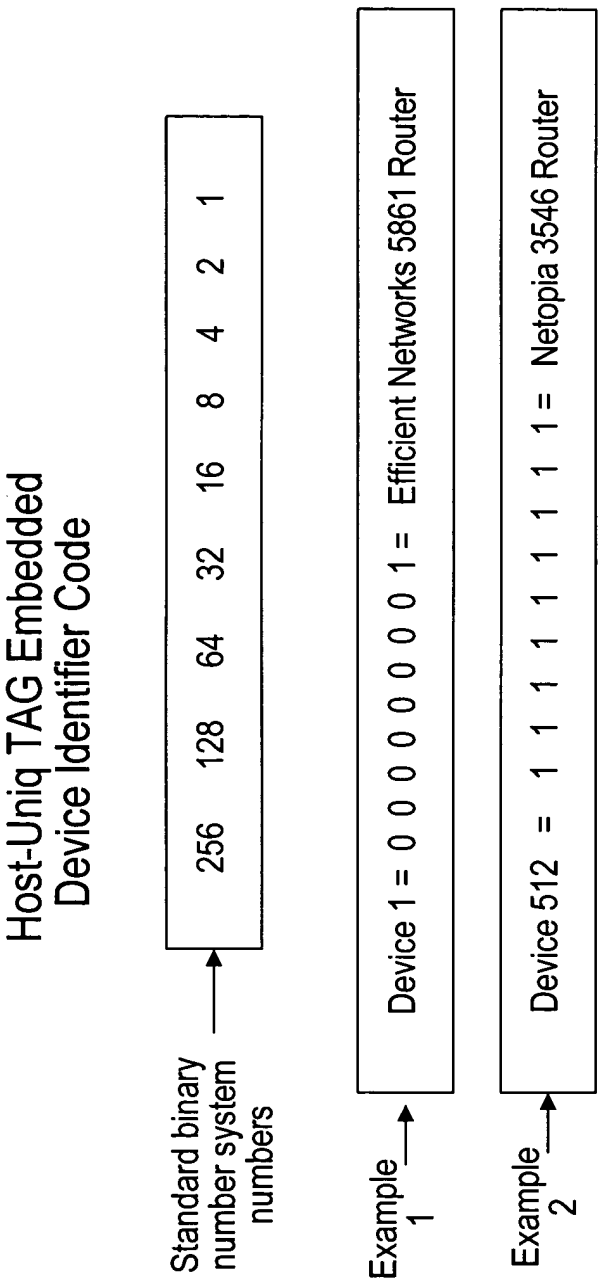

Host-Uniq TAG Embedded
Device Identifier Code
256 128 64 32 16 8 4 2 1
Standard binary number system numbers
Device 1 = 0 0 0 0 0 0 0 0 0 1 = Efficient Networks 5861 Router
Example 1
Device 512 = 1 1 1 1 1 1 1 1 1 1 = Netopia 3546 Router
Example 2

FIG. 8

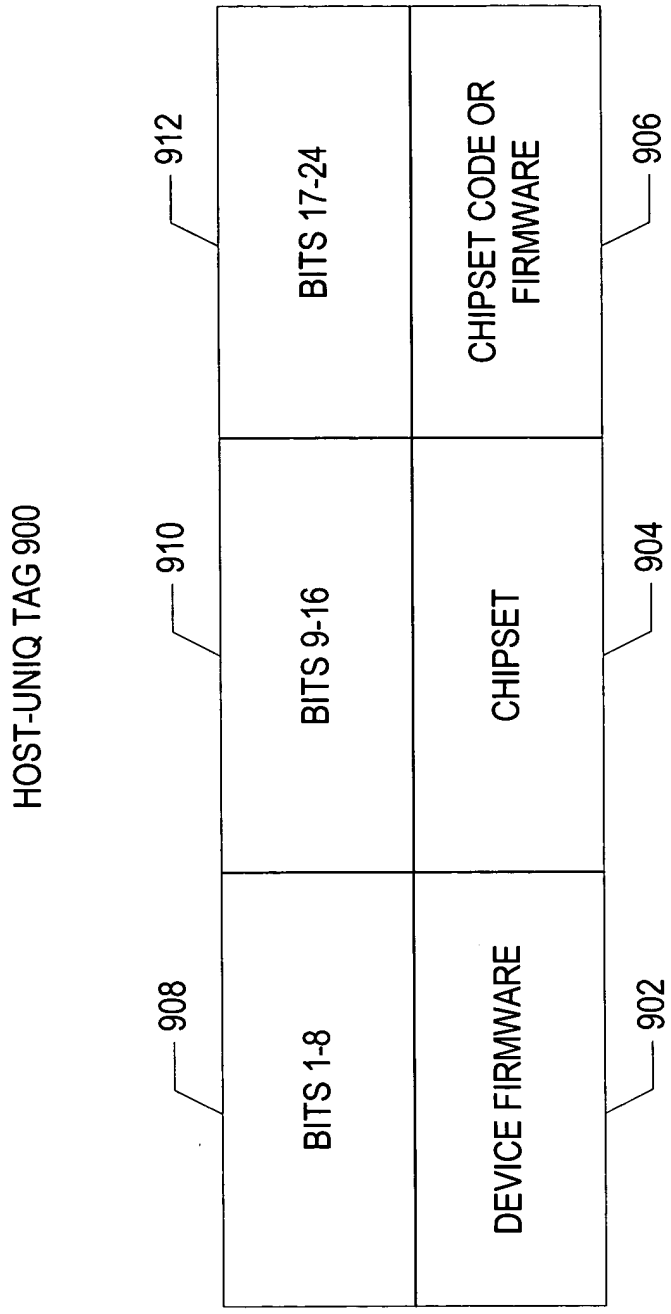

HOST-UNIQ TAG 900
912
BITS 17-24
CHIPSET CODE OR FIRMWARE
906
910
BITS 9-16
CHIPSET
904
908
BITS 1-8
DEVICE FIRMWARE
902

FIG. 9

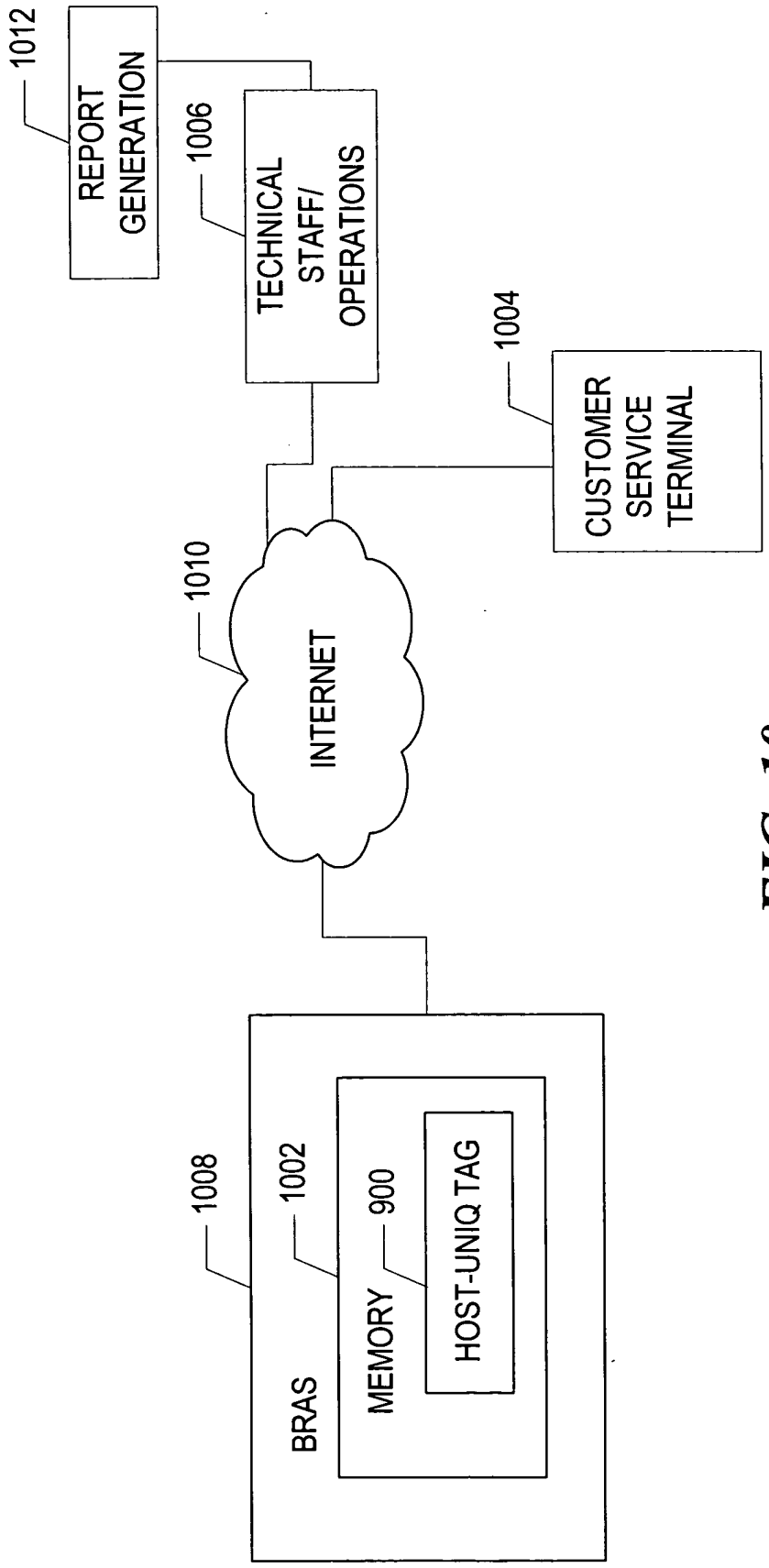
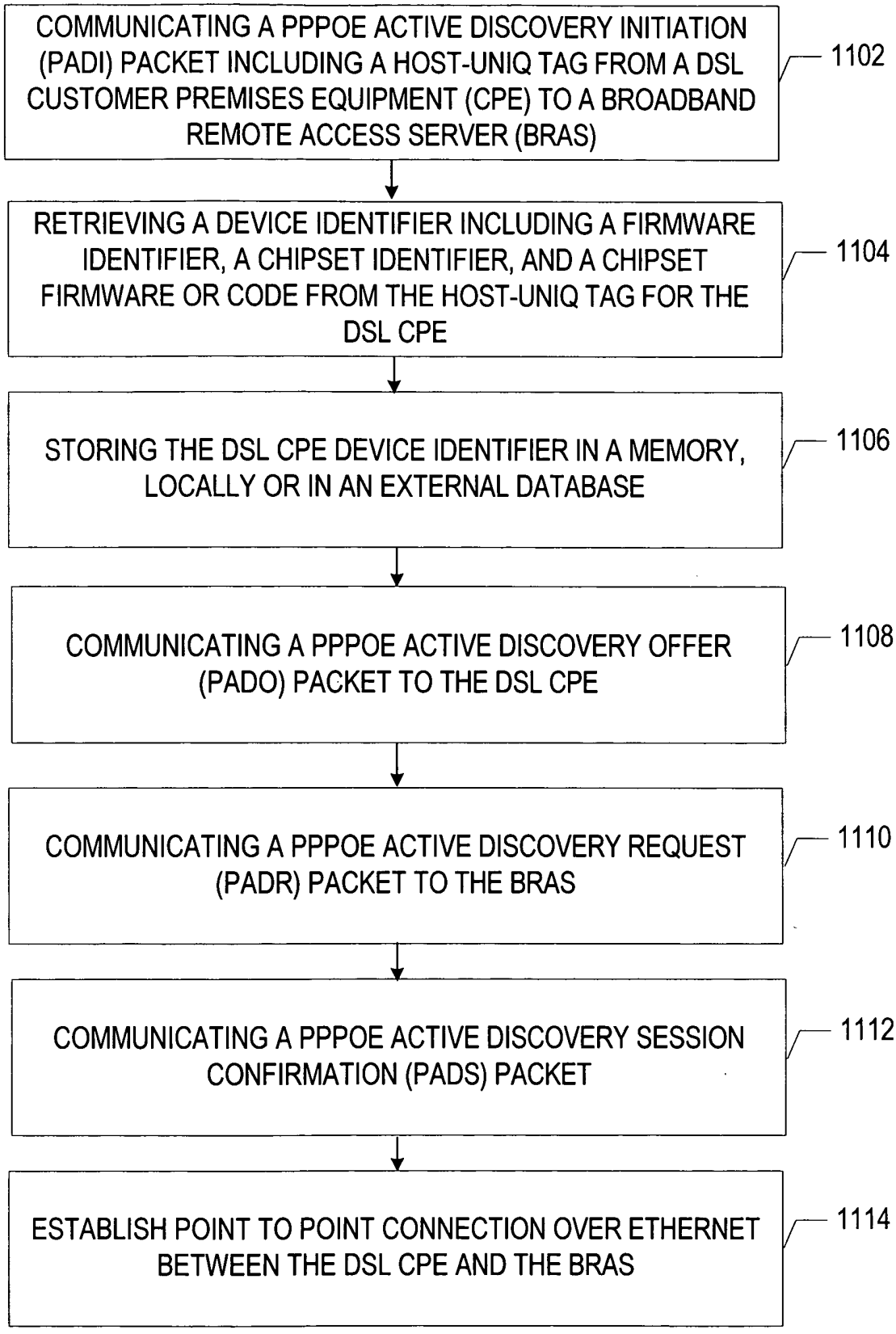
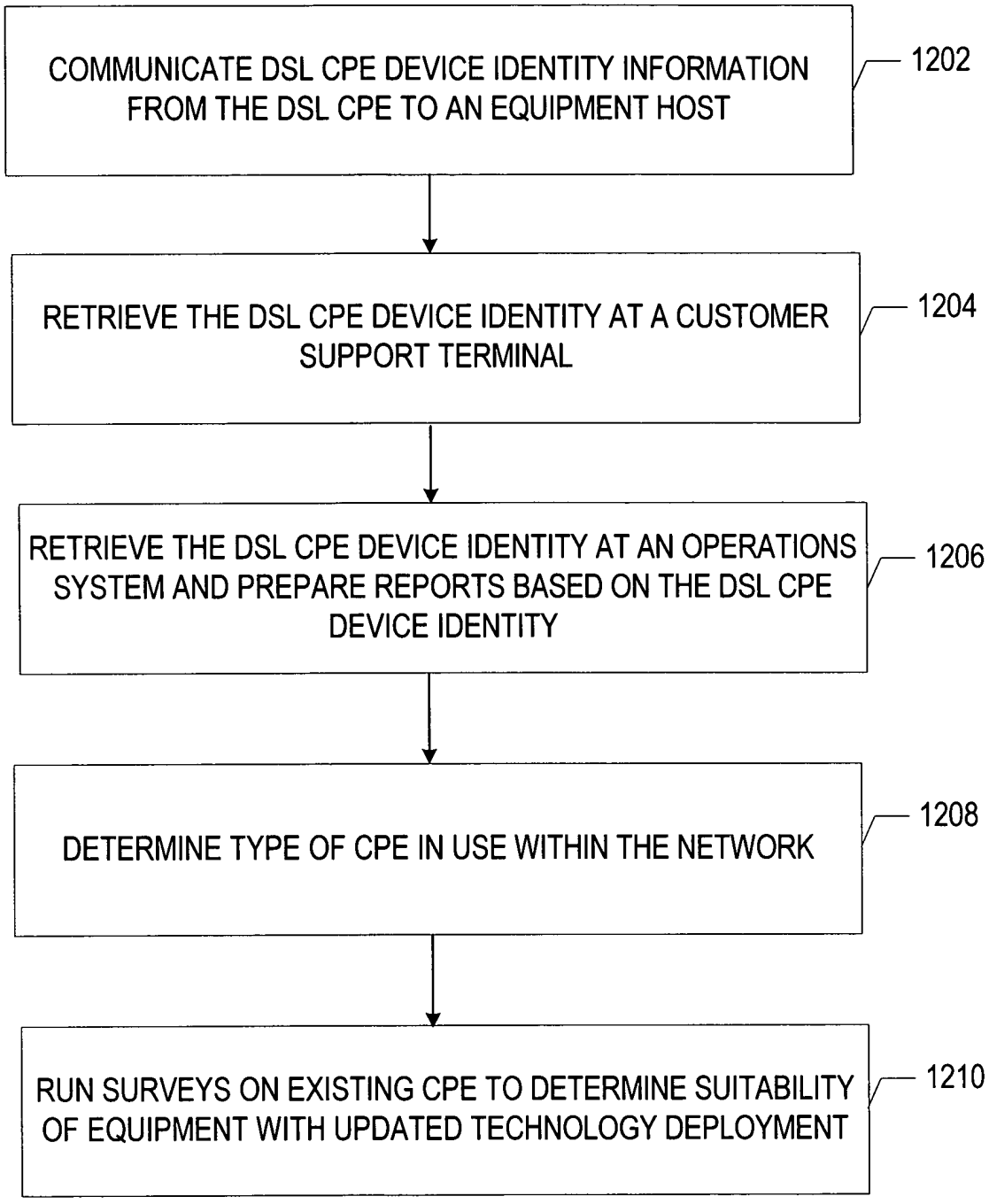

1012
REPORT GENERATION
1006
TECHNICAL STAFF/ OPERATIONS
1004
CUSTOMER SERVICE TERMINAL
1010
INTERNET
1008
BRAS
1002
MEMORY
900
HOST-UNIQ TAG

FIG. 10


COMMUNICATING A PPPOE ACTIVE DISCOVERY INITIATION (PADI) PACKET INCLUDING A HOST-UNIQ TAG FROM A DSL CUSTOMER PREMISES EQUIPMENT (CPE) TO A BROADBAND REMOTE ACCESS SERVER (BRAS)
1102
RETRIEVING A DEVICE IDENTIFIER INCLUDING A FIRMWARE IDENTIFIER, A CHIPSET IDENTIFIER, AND A CHIPSET FIRMWARE OR CODE FROM THE HOST-UNIQ TAG FOR THE DSL CPE
1104
STORING THE DSL CPE DEVICE IDENTIFIER IN A MEMORY, LOCALLY OR IN AN EXTERNAL DATABASE
1106
COMMUNICATING A PPPOE ACTIVE DISCOVERY OFFER (PADO) PACKET TO THE DSL CPE
1108
COMMUNICATING A PPPOE ACTIVE DISCOVERY REQUEST (PADR) PACKET TO THE BRAS
1110
COMMUNICATING A PPPOE ACTIVE DISCOVERY SESSION CONFIRMATION (PADS) PACKET
1112
ESTABLISH POINT TO POINT CONNECTION OVER ETHERNET BETWEEN THE DSL CPE AND THE BRAS
1114


COMMUNICATE DSL CPE DEVICE IDENTITY INFORMATION FROM THE DSL CPE TO AN EQUIPMENT HOST
1202
RETRIEVE THE DSL CPE DEVICE IDENTITY AT A CUSTOMER SUPPORT TERMINAL
1204
RETRIEVE THE DSL CPE DEVICE IDENTITY AT AN OPERATIONS SYSTEM AND PREPARE REPORTS BASED ON THE DSL CPE DEVICE IDENTITY
1206
DETERMINE TYPE OF CPE IN USE WITHIN THE NETWORK
1208
RUN SURVEYS ON EXISTING CPE TO DETERMINE SUITABILITY OF EQUIPMENT WITH UPDATED TECHNOLOGY DEPLOYMENT
1210